

REMARKS

In the Office Action dated June 10, 2003, the Examiner rejected claims 19, 22, 24 and 26-28 under 35 USC 102(e) as being anticipated by Akiyama (US Patent No. 6,307,269), rejected claims 23 and 25 under 35 USC 103(a) as unpatentable over Akiyama, rejected claims 20 and 25 under 35 USC 103(a) as unpatentable over Akiyama and Kato (US Patent No. 6,486,562), rejected claim 21 under 35 USC 103(a) as unpatentable over Akiyama and Morihara (US Patent No. 5,495,439), rejected claims 29-31 under 35 USC 103(a) as unpatentable over Akiyama, rejected claims 32-34 under 35 USC 103(a) as unpatentable over Akiyama and Chiu (US Patent No. 6,391,683), rejected claims 35, 36, 37, 39, 40-42, under 35 USC 103(a) as unpatentable over Akiyama and Holzapfel (US Patent No. 5,872,633), rejected claim 38 under 35 USC 103(a) as unpatentable over Akiyama, Holzapfel and Kato, and rejected claim 43 under 35 USC 103(a) Akiyama, Hoplzapfel and Chiu. In response thereto, the Applicants have amended claim 19, 27, 33, 34 and 35. Claims 19 through 43 remain at issue.

The Art Rejections

The Akiyama reference is directed to a chip scale package, as illustrated in Figures 38, 39a, 39b and 39c, that includes a chip (1), having an active surface (1a) and electrode pads (1b) formed on the periphery of the chip. A thin film substrate (4) having wires (4d) connect the electrode pads (1b) and solder electrodes (2) which are used as terminals to electrically couple the chip scale package to other electrical components. An elastomer (3) is provided on the chip between the active surface (1a) and underneath the electrodes (2). A resin (5) is applied to the openings (3c) in the elastomer (3) and the openings (4e) in the substrate (4) to seal the openings.

Claim 19 is directed to a flip chip where solder balls are formed directly on the chip. An underfill adhesive is formed on the active surface of the chip around the solder balls. Specifically claim 19 recites... “ with solder bumps formed directly an active surface of the flip chip and an

underfill adhesive formed on the active surface of the flip chip integrated circuit and around the solder bumps formed directly onto the active surface ...”. In contrast, the Akiyama reference teaches the: (i) solder electrodes (2) are formed separate from or above the active surface (1a) of the chip; and (ii) elastomer (3) and the resin (5) are formed underneath, not around, the solder electrodes (2).

The Applicants submit that claim 19 is therefore allowable. Although patentable in their own right, claims 20 – 34 are also allowable based on their dependency on claim 19. Finally, although not specifically addressed herein because it is believed to be not necessary, the Applicants disagree with the Examiner’s reasons for rejecting claims 20 – 34. The Applicants failure to substantively address these rejections should not be construed in anyway as an admission by the Applicants as to the veracity of these rejections. The Applicants reserve the right to address these rejections at anytime in the future.

Claim 35 is allowable for essentially the same reasons as provided above. Specifically, the claim recites ... “a layer of at least partially cured underfill adhesive formed around the solder bumps on the active surface of the wafer”. In contrast the Akiyama reference teaches the: (i) the solder electrodes (2) are formed separate from or above the active surface (1a) of the chip; and (ii) the elastomer (3) and the resin (5) are formed underneath, not around, the solder electrodes (2). Therefore, even if it were proper to combine the Akiyama and Holzapfel references, it still would not result in the present invention as claimed. Rather, the combination would result in the chip scale package of Akiyama and the ability to remove thin film layers from a wafer as taught by Holzapfel.

The Applicants submit that claim 35 is therefore allowable. Although patentable in their own right, claims 36-43 are also allowable based on their dependency on claim 19. Finally, although not specifically addressed herein because it is believed not necessary, the Applicants disagree with the Examiner’s reasons for rejecting claims 36-43. The Applicants failure to

substantively address these rejections should not be construed in anyway as an admission by the Applicants as to the veracity of these rejections. The Applicants reserve the right to address these rejections at anytime in the future.

Finally, the Applicants have amended claims 27, 33 and 34. Claim 27 recites the limitation that the underfill adhesive is fully cured when mounted onto the substrate. Claim 33 recites the limitation of a solder paste. Claim 34 recites the limitation of a fluxing material. Applicants believes that none of the claims including 27, 33 and 34 are product by process claims.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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